United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

Joan Shirley 50/2

EPA

December 10, 1990

Reply to:
Attn of: HW-113

American Crossarm

E. G. Amundsen
Chehalis Realty Company
American Crossarm & Conduit Company
P.O. Box 19074
Houston, Texas 77224

Re: **Tacoma Landfill Superfund Site, Tacoma, Washington**

Dear Mr. Amundsen:

This letter is in response to your November 9, 1990, request for copies of the memoranda containing data upon which the Amended Administrative Order was based.

We have the data you requested. Since the Amended Administrative Order was signed and transmitted on October 31, 1990, we have received additional data supporting our position that dioxins and furans are present on the American Crossarm Site. The most pertinent data and information that indicate the significance of dioxins and furans contamination on the American Crossarm Site are enclosed. These documents include:

1. Memorandum dated October 18, 1990.
   To: Lee Marshall, RPM, USEPA, Region X.
   From: Roger McGinnis, Chief Environmental Chemist, WESTON, Seattle.
   Subject: QA of Case 5355J (Dioxins/Furans) SDG No: 5355J-51 American Crossarm and Conduit.

2. Memorandum dated November 12, 1990.
   To: Lee Marshall, RPM, USEPA, Region X.
   From: Roger McGinnis, Chief Environmental Chemist, WESTON, Seattle.
   Subject: QA of Case 5355J (Dioxins/Furans) SDG No: 5355J-51 American Crossarm and Conduit.

3. Interoffice Memorandum dated October 1, 1990.
   To: Steve Fuller - Site Manager
   Keith Pine - RI Manager
   From: Roger McGinnis - RSO.
   Subject: Site Access/Health Safety Plan Modifications

The memoranda dated October 9, 1990, which were cited in the Amended Administrative Order, are voluminous. Therefore, they are not enclosed. However, we will make these documents available for your review upon request.

If you have any questions on this matter, do not hesitate to call Lee Marshall at (206) 553-2723.

Sincerely,

Kevin Oates

Kevin Oates, Chief
Superfund Site Management
Section II

cc: Steve Glancy, Perkins Coie

Enclosures

bcc: Joan Shirley, ORC

ROY F. WESTON, INC.
201 ELLIOTT AVENUE WEST
SUITE 500
SEATTLE, WA 98119
PHONE: (206) 286-6000

MEMORANDUM

DATE: October 18, 1990

TO: Lee Marshall, RPM, USEPA, Region X

FROM: Rmm Roger McGinnis, Chief Environmental Chemist, WESTON, Seattle

SUBJECT: QA of Case 5355J (Dioxins/Furans)
SDG No.: 5355J-51
American Crossarm and Conduit

DOC. CONTROL NO.: 4000-01-24-AABC

WORK ORDER NO.: 4000-01-24-0004

cc: Laura Castrilli, RSCC, USEPA, Region X
Gerald Muth, DPO, USEPA, Region X (memo only)
Tom Bennett, DPO, USEPA, Region IV (memo only)
Robert Melton, QA Management Branch, USEPA, Region X
Steve Fuller, Project Manager, WESTON, Seattle (memo only)
Craig Mitchell, Data Base Manager, WESTON, Seattle

The quality assurance review of 35 samples, Case 5355J, collected from American Crossarm and Conduit has been completed. The 35 soil samples were analyzed at low level for polychlorinated dibenzodioxins and furans (PCDD/PCDF) by Southern Research Institute of Birmingham, Alabama, using EPA Method 8290. The samples were numbered:

5355J-51	5355J-52	5355J-53
5355J-54	5355J-55	5355J-56
5355J-57	5355J-58	5355J-59
5355J-60	5355J-61	5355J-62
5355J-63	5355J-64	5355J-65
5355J-66	5355J-67	5355J-68
5355J-69	5355J-70	5355J-71
5355J-72	5355J-73	5355J-74
5355J-75	5355J-76	5355J-77
5355J-78	5355J-79	5356J-80
5355J-81	5355J-82	5355J-83
5355J-84	5355J-85	

Data Qualifications

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in USEPA Method 8290 (May 1987) and described in the Special Analytical Services Request "ESAT-10-557."

1. Timeliness

   No holding time criteria have been established though EPA Region X has approved holding times of six months for archived soil samples. Samples were held at 4°C for up to 140 days. Samples were extracted within 5 days after laboratory receipt and analyzed within 30 days after extraction.

2. Mass Resolution (10,000) Check - Acceptable

3. Column Performance Check

   All column performance check analyses met criteria. Results for run V02886 performed on 11 July 1990 were not present. The laboratory stated data could not be retrieved from the data system.

   a. Peak Resolution - Acceptable

      Standards met peak valley criteria of less than 25 percent between $^{13}C_{12}$ - 1,2,3,4-TCDD and $^{13}C_{12}$ - 2,3,7,8-TCDD at m/z 334.

   b. Retention Time Windows - Acceptable

   c. Instrument Mass Lock - Acceptable

      Perfluorokerosene mass lock was stable.

4. Initial Calibration

   a. Internal Standard Retention Time - Acceptable

   b. Peak Retention Time Ratios - Acceptable

   c. Internal Standard Recovery - Acceptable

      Internal standard recoveries met both laboratory advisory limits of 40 to 120 percent and EPA SAS QC limits of 60 to 140 percent.

d. Isotopic Peak Area Ratios

Relative ion abundance ratios met method criteria for all compounds except:

Calibration Standard	Compound	Ratio	QC Limits
CS1	2,3,7,8-TCDF	0.639	0.65 - 0.89
CS2	2,3,7,8-TCDF	0.623	0.65 - 0.89

No action was taken since the variance appeared to be a result of poor integration of a noisy baseline.

e. Peak Coincidence - Acceptable

Peaks for M/M^{+2} or M^{+2}/M^{+4} maximized within two scans of one another.

f. Linearity - Acceptable

Relative response factors (RRF) met relative standard deviation (RSD) criteria of 35 percent.

5. Continuing Calibrations

a. Internal Standard Retention Time - Acceptable

All internal standard retention times were within 0.25 minutes of those established in the initial calibration except:

Calibration	Compound	RT Difference	QC Limits
V02908	$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	0.283	0.25

No action was taken.

b. Peak Retention Time Ratios - Acceptable

c. Internal Standard Calculated Recovery

Calibration standard recoveries calculated using internal standards met laboratory advisory limits for all compounds except those listed below. Laboratory limits are slightly more stringent than the 60 to 140 percent recovery requested by EPA.

Calibration	Compound	Percent Recovery	QC Limits
2726	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	54.8	60 - 140
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	55.0	
	OCDF	28.0	
	OCDD	28.8	
	$^{13}C_{12}$-OCDD	56.2	
2737	$^{13}C_{12}$-OCDD	56.2	60 - 140

Total PCDD/PCDF results calculated by the internal standard method for compounds and samples associated with the above calibration have been flagged "J" (estimated quantity) when recoveries exceed EPA limits of 60 to 140 percent.

d. Isotope Dilution Calculated Recovery

Calibration standard recoveries calculated using isotope dilution standards met laboratory advisory limits for all compounds. Laboratory limits are 65 to 130 percent recovery compared to EPA requested limits of 60 to 140 percent.

e. Internal Standard Calculated RRF Percent Difference

Calibration standard RRF percent differences calculated using internal standards met EPA organics analysis limits of 25 percent for all samples except those listed below. Laboratory advisory limits were 20 percent.

Calibration	Compound	Percent Difference	QC Limits
2717	2,3,7,8-TCDF	25.1	20

Calibration	Compound	Percent Difference	QC Limits
2726	2,3,7,8-TCDD	25.8	20
	1,2,3,4,6,7,8-HpCDF	34.5	20
	1,2,3,4,7,8,-HpCDF	37.7	20
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	38.3	20
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	45.2	20
	1,2,3,4,6,7,8-HpCDD	36.5	20
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	44.9	20
	OCDF	71.99	20
	OCDD	71.21	20
	$^{13}C_{12}$-OCDD	71.88	20
2737	^{37}Cl-2,3,7,8-TCDD	25.2	20
	2,3,7,8-TCDF	29.2	20
	2,3,7,8-TCDD	29.4	20
	1,2,3,7,8,9-HxCDF	25.6	20
	OCDF	36.2	20
	OCDD	35.1	20
	$^{13}C_{12}$-OCDD	43.7	20
2778	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	25.1	20
2787	^{37}Cl-2,3,7,8-TCDD	34.36	20
	2,3,7,8-TCDF	27.78	20
	2,3,7,8-TCDD	29.84	20
2863	2,3,7,8-TCDF	33.97	20
	2,3,7,8-TCDD	26.11	20
	1,2,3,7,8,9-HxCDF	26.66	20
	1,2,3,4,7,8,9-HpCDF	30.35	20
	OCDF	30.16	20
2872	^{37}Cl-2,3,7,8-TCDD	25.59	20
	2,3,7,8-TCDF	35.51	20
	2,3,7,8-TCDD	26.40	20
2884	2,3,4,7,8-PeCDF	25.82	20
	1,2,3,7,8-PeCDD	26.52	20
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	25.16	20
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	26.31	20

Calibration	Compound	Percent Difference	QC Limits
2887	OCDD	35.87	20
2896	2,3,4,7,8-PeCDF	29.85	20
	1,2,3,7,8-PeCDD	35.60	20
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	29.03	20
	OCDF	42.58	20
	OCDD	38.34	20
	$^{13}C_{12}$-OCDD	42.23	20
2899	2,3,7,8-TCDF	25.61	20
	1,2,3,7,8-PeCDF	26.74	20
	2,3,4,7,8-PeCDF	37.72	20
	1,2,3,7,8-PeCDD	32.93	20
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	34.24	20
	OCDF	25.47	20
	OCDD	30.84	20
2908	1,2,3,7,8-PeCDF	52.45	20
	2,3,4,7,8-PeCDF	59.09	20
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	55.61	20
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	62.17	20
	1,2,3,7,8-PeCDD	61.40	20
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	61.62	20
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	25.21	20
	1,2,3,4,6,7,8-HpCDD	43.27	20
2912	1,2,3,4,7,8,9-HpCDF	37.06	20
	1,2,3,4,6,7,8-HpCDD	31.31	20
	OCDF	32.14	20
	OCDD	37.83	20
	$^{13}C_{12}$-OCDD	37.48	20

Calibration	Compound	Percent Difference	QC Limits
2918	1,2,3,7,8-PeCDF	42.16	20
	2,3,4,7,8-PeCDF	49.45	20
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	48.17	20
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	55.85	20
	1,2,3,7,8-PeCDD	54.29	20
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	60.08	20
	1,2,3,4,6,7,8-HpCDF	29.56	20
	1,2,3,4,7,8,9-HpCDF	26.17	20
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	43.34	20
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	40.02	20
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	42.65	20
	OCDF	30.03	20
	OCDD	27.43	20
	$^{13}C_{12}$-OCDD	38.68	20
2989	2,3,7,8-TCDF	27.01	20
	2,3,7,8-TCDD	26.93	20
	1,2,3,4,7,8,9-HpCDF	32.37	20
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	25.42	20
	1,2,3,4,6,7,8-HpCDD	32.53	20
	OCDF	34.96	20
	OCDD	50.01	20
	$^{13}C_{12}$-OCDD	34.90	20
2997	2,3,7,8-TCDF	29.70	20
	1,2,3,4,6,7,8-HpCDD	39.54	20

Results calculated by the internal standard method were flagged "J" (estimated quantity) for the compounds and samples associated with the above calibrations only when EPA limits of 25 percent were exceeded.

f. Isotope Dilution Calculated RRF Percent Difference

Calibration standard RRF percent differences calculated using isotope dilution standards met EPA organics analysis limits of 25 percent for all compounds except those listed below. Laboratory advisory limits were 20 percent.

Calibration	Compound	Percent Difference	QC Limits
2729	1,2,3,7,8,9-HxCDD	26.68	20
2737	2,3,4,7,8-PeCDF	28.02	20
	1,2,3,7,8,9-HxCDD	28.50	20
2899	1,2,3,7,8,9-HxCDD	28.73	20
2908	1,2,3,4,6,7,8-HpCDF	29.24	20
	1,2,3,4,7,8,9-HpCDF	25.67	20
	1,2,3,4,6,7,8-HpCDD	60.00	20
	OCDF	28.29	20
2918	1,2,3,4,6,7,8-HpCDD	32.16	20

Results calculated by isotope dilution were flagged "J" (estimated quantity) for the compounds and samples associated with the above calibrations only when EPA limits of 25 percent were exceeded.

g. Isotopic Peak Area Ratios

Relative ion abundance ratios met method criteria for all compounds.

h. Peak Relative Retention Time Ratios - Acceptable

i. Peak Coincidence - Acceptable

Peaks for M/M^{+2} or M^{+2}/M^{+4} maximized within two scans of one another for all compounds except the following

Calibration Run	Compound	RT Difference (scans)	QC Limits
2908	1,2,3,4,6,7,8-HxCDD	3	2

No action was taken.

6. Instrument Detection Limits - Acceptable

Instrument detection limits were not provided by the laboratory. However, all analyses met contract required quantitation limits (CRQL).

7. Laboratory Method Blanks - Acceptable

Laboratory method blank frequency criteria were met.

The following compounds were detected in laboratory method blanks.

Blank Run	Compound	Concentration (ng/kg)	CRQL (ng/kg)
2888	1,2,3,4,6,7,8-HpCDF	810.7	1000
(0.1g sample)	1,2,3,4,6,7,8-HpCDD	4989.0	1000
	OCDF	1673.0	2000
	OCDD	37,450.0	2000
2913	1,2,3,4,6,7,8-HpCDD	36.7	10
(10 g sample)	OCDF	10.8	20
	OCDD	377.0	20

Reported levels of the above compounds were flagged "UJ" (undetected, adjusted quantitation limit) in associated samples if concentrations were less than five times concentrations present in the blank.

8. Matrix Spike and Matrix Spike Duplicate - Acceptable

Sample 5355J-59 underwent matrix spike and matrix spike duplicate analyses. All matrix spike (MS) and matrix spike duplicate (MSD) percent recoveries met QC guidelines of 70 - 130 percent. All relative percent differences between the MS and MSD recoveries were within SAS QC guidelines of 35 percent.

9. Field Duplicate Analysis

No field duplicates were submitted with this sample delivery group.

10. Performance Evaluation Sample Results

Two performance evaluation samples obtained from the EPA Region X laboratory were submitted to the laboratory with this sample delivery group. Sample 5355J-69 was a blank sample certified to contain no 2,3,7,8-TCDD though it does contain other dioxin homologues. The laboratory did not report any 2,3,7,8-TCDD present. Sample 5355J-70 was a PE sample certified to contain 3800 $\pm$ 200 ng/kg of 2,3,7,8-TCDD. The laboratory reported 6810 ng/kg calculated by recovery corrected isotope dilution and 3880 ng/kg calculated by the uncorrected internal standard method. $^{13}C_{12}$-2,3,7,8-TCDD recovery for this sample was 57 percent. The large difference appears to be a result of the recovery correction inherent in the isotope dilution technique.

All isotope dilution results with labeled standard recoveries outside the range of 70 - 130 percent have been flagged "J" (estimated concentration). Quantitation limits for compounds with labeled standard recoveries less than 10 percent have been flagged "R" (rejected).

11. Sample Analysis and Peak Identification Criteria

a. Internal Standard Retention Time

Retention time differences for internal standards were within QC guidelines of less than 0.25 minutes for all samples except:

Sample No.	Standard	RT Difference
5355J-62	$^{13}C_{12}$-1,2,3,4-TCDD	0.477
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	0.333
5355J-74	$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	0.283
5355J-72	$^{13}C_{12}$-1,2,3,4-TCDD	0.493
5355J-64	$^{13}C_{12}$-1,2,3,4-TCDD	0.710
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	0.400
5355J-52	$^{13}C_{12}$-1,2,3,4-TCDD	0.493

No action was taken since retention time shifts appeared to be a result of column overloading due to high concentrations of analytes present.

b. Standard Peak Relative Retention Time Ratios

Standard peak retention time ratios met QC guidelines for all samples except:

Sample No.	Compound	RT Ratio	QC Limits
5355J-72	$^{13}C_{12}$1,2,3,7,8-PeCDD	1.204	1.210 - 1.221
5355J-64	$^{13}C_{12}$2,3,4,7,8-PeCDF	1.185	1.191 - 1.204
	$^{13}C_{12}$1,2,3,7,8-PeCDD	1.201	1.210 - 1.221

c. Compound Retention Time

All compounds reported by the laboratory were within retention time windows established by calibrations except:

Sample No.	Compound	RT	QC Limits
5355J-74	OCDF	3117	3120 - 3123
	OCDD	3109	3110 - 3113
5355J-65	OCDF	3100	3104 - 3107
	OCDD	3091	3094 - 3097
5355J-72	1,2,3,7,8,9-HxCDF	2630	2623 - 2626
	2,3,4,6,7,8-HxCDF	2565	2569 - 2572
	OCDF	3098	3100 - 3103
	OCDD	3088	3090 - 3093
5355J-71	1,2,3,7,8,9-HxCDF	2624	2616 - 2619
5355J-69	1,2,3,7,8,9-HxCDD	2610	2611 - 2614
5355J-64	1,2,3,7,8,9-HxCDF	2646	2639 - 2642
	2,3,4,6,7,8-HxCDF	2581	2585 - 2588
	1,2,3,4,7,8-HxCDD	2604	2596 - 2599
	OCDF	3130	3131 - 3134

d. Internal Standard Recovery

Laboratory and analytical method guidelines for labelled internal standard recoveries are 40 to 120 percent. Based on performance evaluation sample results which indicated potential problems with the recovery correction inherent in the analytical method, more stringent EPA SAS criteria were employed by the reviewer. Analytical results and detection limits for compounds with associated standard recoveries outside the range of 60 to 140 percent were flagged "J" (estimated). Detection limits for compounds with associated standard recoveries of less than 10 percent were flagged "R" (rejected). All compounds reported by the laboratory met these revised recovery criteria except the following:

Sample No.	Internal Standard	Percent Recovery	QC Limit
5355J-62	^{37}Cl-2,3,7,8-TCDD	24	60 - 140
	$^{13}C_{12}$-2,3,7,8-TCDF	26	
	$^{13}C_{12}$-2,3,7,8-TCDD	24	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	13	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	14	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	11	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	24	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	24	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	24	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	23	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	22	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	20	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	25	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	24	
	$^{13}C_{12}$-OCDD	25	
5355J-78	^{37}Cl-2,3,7,8-TCDD	54	60 - 140
	$^{13}C_{12}$-2,3,7,8-TCDF	49	
	$^{13}C_{12}$-2,3,7,8-TCDD	47	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	22	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	19	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	17	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	56	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	59	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	57	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	51	

Sample No.	Internal Standard	Percent Recovery	QC Limit
5355J-78 (cont)	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	48	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	48	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	46	
	$^{13}C_{12}$-OCDD	45	
5355J-76	$^{13}C_{12}$-2,3,7,8-TCDF	46	60 - 140
	$^{13}C_{12}$-2,3,7,8-TCDD	48	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	34	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	32	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	31	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	53	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	50	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	49	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	52	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	45	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	36	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	32	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	33	
	$^{13}C_{12}$-OCDD	29	
5355J-85	^{37}Cl-2,3,7,8-TCDD	58	60 - 140
	$^{13}C_{12}$-2,3,7,8-TCDF	48	
	$^{13}C_{12}$-2,3,7,8-TCDD	50	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	46	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	39	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	48	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	59	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	57	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	55	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	56	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	49	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	42	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	37	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	37	
	$^{13}C_{12}$-OCDD	28	

Sample No.	Internal Standard	Percent Recovery	QC Limit
5355J-74	$^{13}C_{12}$-2,3,7,8-TCDD	58	60 - 140
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	22	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	21	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	18	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	52	
	$^{13}C_{12}$-OCDD	47	
5355J-65	$^{13}C_{12}$-OCDD	30	60 -140
5355J-71	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	59	60 - 140
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	59	
	$^{13}C_{12}$-OCDD	28	
5355J-61	^{37}Cl-2,3,7,8-TCDD	42	60 - 140
	$^{13}C_{12}$-2,3,7,8-TCDF	31	
	$^{13}C_{12}$-2,3,7,8-TCDD	36	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	52	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	58	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	47	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	38	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	40	
	$^{13}C_{12}$-OCDD	22	
5355J-83	^{37}Cl-2,3,7,8-TCDD	47	60 - 140
	$^{13}C_{12}$-2,3,7,8-TCDF	37	
	$^{13}C_{12}$-2,3,7,8-TCDD	40	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	39	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	36	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	38	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	44	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	43	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	41	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	46	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	36	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	26	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	24	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	26	
	$^{13}C_{12}$-OCDD	20	

Sample No.	Internal Standard	Percent Recovery	QC Limit
5355J-80	$^{13}C_{12}$-2,3,7,8-TCDF	46	60 - 140
	$^{13}C_{12}$-2,3,7,8-TCDD	44	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	44	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	41	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	43	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	53	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	48	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	46	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	56	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	45	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	33	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	27	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	30	
	$^{13}C_{12}$-OCDD	24	
5355J-79	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	59	60 - 140
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	59	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	55	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	44	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	54	
	$^{13}C_{12}$-OCDD	42	
5355J-75	^{37}Cl-2,3,7,8-TCDD	17	60 - 140
	$^{13}C_{12}$-2,3,7,8-TCDF	10	
	$^{13}C_{12}$-2,3,7,8-TCDD	13	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	36	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	44	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	51	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	48	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	51	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	56	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	51	
5355J-63	$^{13}C_{12}$-2,3,7,8-TCDF	51	60 - 120
	$^{13}C_{12}$-2,3,7,8-TCDD	46	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	37	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	42	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	34	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	48	

Sample No.	Internal Standard	Percent Recovery	QC Limit
5355J-63 (cont)	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	52	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	54	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	46	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	37	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	47	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	45	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	38	
	$^{13}C_{12}$-OCDD	31	
5355J-77	$^{13}C_{12}$-2,3,7,8-TCDF	55	60 - 120
	$^{13}C_{12}$-2,3,7,8-TCDD	52	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	48	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	53	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	51	
	$^{13}C_{12}$-OCDD	42	
5355J-59	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	51	60 - 140
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	54	
	$^{13}C_{12}$-OCDD	38	
5355J-81	^{37}Cl-2,3,7,8-TCDD	42	60 - 120
	$^{13}C_{12}$-2,3,7,8-TCDF	33	
	$^{13}C_{12}$-2,3,7,8-TCDD	37	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	26	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	21	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	22	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	39	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	37	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	36	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	48	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	33	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	29	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	24	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	30	
	$^{13}C_{12}$-OCDD	23	

Sample No.	Internal Standard	Percent Recovery	QC Limit
5355J-73	$^{13}C_{12}$-2,3,7,8-TCDF	35	60 - 120
	$^{13}C_{12}$-2,3,7,8-TCDD	39	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	35	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	36	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	34	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	34	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	36	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	31	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	39	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	33	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	21	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	15	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	17	
	$^{13}C_{12}$-OCDD	12	
5355J-70	$^{13}C_{12}$-2,3,7,8-TCDF	54	60 - 120
	$^{13}C_{12}$-2,3,7,8-TCDD	57	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	59	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	48	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	44	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	57	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	53	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	59	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	54	
	$^{13}C_{12}$-OCDD	49	
5355J-72	$^{13}C_{12}$-1,2,3,7,8-PeCDF	58	60 - 120
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	54	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	55	
5355J-69	$^{13}C_{12}$-2,3,7,8-TCDF	39	60 - 140
	$^{13}C_{12}$-2,3,7,8-TCDD	37	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	39	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	42	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	41	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	43	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	43	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	52	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	50	

Sample No.	Internal Standard	Percent Recovery	QC Limit
5355J-69 (cont)	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	46	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	56	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	57	
	$^{13}C_{12}$-OCDD	59	
5355J-68	$^{13}C_{12}$-2,3,7,8-TCDF	43	60 - 140
	$^{13}C_{12}$-2,3,7,8-TCDD	41	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	24	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	21	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	19	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	50	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	51	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	39	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	51	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	45	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	32	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	26	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	30	
	$^{13}C_{12}$-OCDD	24	
5355J-67	$^{13}C_{12}$-2,3,7,8-TCDF	57	60 - 120
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	50	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	36	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	30	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	29	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	28	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	12	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	43	
	$^{13}C_{12}$-OCDD	32	
5355J-64	$^{13}C_{12}$-1,2,3,7,8-PeCDF	44	60 - 140
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	35	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	30	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	48	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	52	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	51	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	55	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	49	

Sample No.	Internal Standard	Percent Recovery	QC Limit
5355J-60	$^{13}C_{12}$-1,2,3,7,8-PeCDF	56	60 - 140
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	52	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	57	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	58	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	58	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	57	
	$^{13}C_{12}$-OCDD	48	
5355J-56	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	30	60 - 140
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	36	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	9	
	$^{13}C_{12}$-OCDD	39	
5355J-55	$^{13}C_{12}$-2,3,7,8-TCDF	18	60 - 140
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	59	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	31	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	56	
	$^{13}C_{12}$-OCDD	42	
5355J-51	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	22	60 - 140
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	34	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	8	
5355J-52	$^{13}C_{12}$-2,3,7,8-TCDF	19	60 - 140
	$^{13}C_{12}$-2,3,7,8-TCDD	51	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	7	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	11	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	57	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	59	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	27	
5355J-58	$^{13}C_{12}$-2,3,7,8-TCDF	56	60 - 140
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	47	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	38	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	40	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	57	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	58	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	52	

Sample No.	Internal Standard	Percent Recovery	QC Limit
5355J-58 (cont)	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	50	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	41	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	48	
	$^{13}C_{12}$-OCDD	40	
5355J-54	$^{13}C_{12}$-2,3,7,8-TCDF	37	60 - 140
	$^{13}C_{12}$-2,3,7,8-TCDD	46	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	58	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	59	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	57	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	37	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	57	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	40	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	18	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	51	
	$^{13}C_{12}$-OCDD	37	
5355J-53	$^{13}C_{12}$-2,3,7,8-TCDF	42	60 - 140
	$^{13}C_{12}$-2,3,7,8-TCDD	46	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	51	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	54	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	54	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	59	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	56	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	59	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	48	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	53	
	$^{13}C_{12}$-OCDD	42	
5355J-66	$^{13}C_{12}$-1,2,3,7,8-PeCDD	52	60 - 140
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	58	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	59	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	58	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	56	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	58	
	$^{13}C_{12}$-OCDD	39	

Sample No.	Internal Standard	Percent Recovery	QC Limit
5355J-82	$^{13}C_{12}$-2,3,7,8-TCDF	32	60 - 140
	$^{13}C_{12}$-2,3,7,8-TCDD	30	
	$^{13}C_{12}$-1,2,3,7,8-PeCDF	30	
	$^{13}C_{12}$-2,3,4,7,8-PeCDF	35	
	$^{13}C_{12}$-1,2,3,7,8-PeCDD	27	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	34	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	31	
	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	37	
	$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	35	
	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	33	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	35	
	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	34	
	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	32	
	$^{13}C_{12}$-OCDD	28	

e. Isotopic Peak Area Ratios

Relative ion abundance ratios met method criteria for all internal standards and compounds reported as present by the laboratory except:

Sample	Compound	Ratio	QC Limit
5355J-76	1,2,3,6,7,8-HxCDD	1.634	1.05 - 1.43
5355J-65	OCDD	0.464	0.76 - 1.02
	$^{13}C_{12}$-OCDD	1.552	0.76 - 1.02
5355J-72	OCDD	0.542	0.76 - 1.02
	$^{13}C_{12}$-OCDD	1.055	0.76 - 1.02
5355J-80	1,2,3,7,8-PeCDD	1.797	1.32 - 1.78
	1,2,3,6,7,8-HxCDF	1.465	1.05 - 1.43
5355J-79	1,2,3,7,8,9-HxCDD	1.466	1.05 - 1.43

Sample	Compound	Ratio	QC Limit
5355J-84	1,2,3,4,7,8-HxCDD	1.490	1.05 - 1.43
5355J-63	1,2,3,6,7,8-HxCDF	1.470	1.05 - 1.43
5355J-77	1,2,3,4,7,8,9-HpCDF	0.877	0.88 - 1.20
5355J-64	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF $^{13}C_{12}$-OCDD	0.429 1.031	0.43 - 0.59 0.76 - 1.02
5355J-82	OCDF	0.747	0.76 - 1.02

No action was taken since ratio variances appeared to be a result of detector saturation due to high concentration of analytes present.

f. Peak Coincidence - Acceptable

Peaks for M/M^{+2} or M^{+2}/M^{+4} maximized within two seconds of one another for all compounds reported by the laboratory except

Sample No.	Compound	RT Difference (sec)
5355J-65	OCDD $^{13}C_{12}$-OCDD	3 5
5355J-72	OCDD	5

No action was taken since differences appeared to be a result of detector saturation due to high concentrations of analytes present.

11. Sample Analysis

Many samples contained high concentrations of chlorinated dioxins and furans as well as petroleum hydrocarbons resulting in both column overloading and detector saturation. While a number of quality control parameters are listed as not meeting criteria, this is likely due to the sample matrices. All

compounds which been reported are confirmed, though concentrations, in many cases, must be considered estimates.

12. Laboratory Contact

The laboratory was contacted on August 2,1990. Refer to the attached telephone log.

Data Assessment

The usefulness of the data is based on the criteria outlined in USEPA Method 8290 (May 1987) and described in the Special Analytical Services Request "ESAT-10-557."

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers which modify the usefulness of the individual values.

Additional data packages associated with this project are expected from CLP or EPA laboratories.

Data Qualifiers

U - The material was analyzed for, but was not detected. The associated numerical value is an estimated sample quantitation limit.

J - The associated numerical value is an estimated quantity because quality control criteria were not met or concentrations reported were less than the CRDL.

R - Quality Control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

Q - No analytical result.

N - Presumptive evidence of presence of material (tentative identification).

B - The compound was found in the laboratory blank as well as the sample.

E - Reported concentration exceeded the calibration range.

Project 7104

In Reference to Case No(s):
53555 ~~-Task 3~~
SDG# V02722

Contract Laboratory Program
REGIONAL/LABORATORY COMMUNICATION SYSTEM
Telephone Record Log

Date of Call: 8/2/90

Laboratory Name: Southern Research Institute
Lab Contact: David Weinberg
Region: WESTON - EPA 10
Regional Contact: Roger McGinnis

Call Initiated By: ___ Laboratory X Region

In reference to data for the following sample number(s):
53555-59MSD (V02991); lab method blanks: V02718, V02730, V02754, ~~V02757~~ V02767, V02772, V02779, V02781, V02784, V02864, V02876, V02900, V02902
~~case called for 6/15/90 [illegible]~~

Summary of Questions/Issues Discussed:
(1) Above data are not present in data package

Summary of Resolution:
(1) MSD results will be sent

(2) Blanks are reruns of the blanks prepared on date of extraction.

Roger McGinnis — Signature
8/2/90 — Date

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TABLE 2. RESULTS OF ANALYSES: SPECIFIC COMPONENTS

Component	Detect Limit	Concentration, (ng/kg) V02722 5355J53	V02723 5355J54	V02724 5355J57	V02725 5355J58	V02731 5355J52	V02732 5355J51	V02733 5355J55	V02734 5355J56	V02735 5355J59	V02736 5355J59MS
2,3,7,8-TCDF	2	11.1 J	ND U J	ND	ND U J	ND U J	ND U	ND U J	ND U	ND U	115
2,3,7,8-TCDD	2	ND U J	ND U J	ND	ND U	ND U J	ND U	ND U	ND U	ND U	129
1,2,3,7,8-PECDF	10	ND U J	ND U	ND	ND U J	ND U	ND U	ND U	ND U	ND U	641
2,3,4,7,8-PECDF	10	ND U J	ND U J	ND	ND U J	ND U J	ND U	ND U	ND U	ND U	623
1,2,3,7,8-PECDD	10	ND U J	ND U J	ND	ND U J	ND U J	ND U	ND U	ND U	ND U	635
1,2,3,4,7,8-HXCDF	10	ND U J	ND U J	ND	16.5	ND U	ND U	ND U	ND U	ND U	646
1,2,3,6,7,8-HXCDF	10	ND U	ND U	ND	ND U J	ND U	ND U	ND U	ND U	ND U	592
1,2,3,7,8,9-HXCDF	10	ND U	ND U J	ND	ND U J	ND U J	ND U J	ND U	ND U J	ND U	667
2,3,4,6,7,8-HXCDF	10	ND U	ND U J	ND	ND U J	ND U J	ND U J	ND U	ND U J	ND U	672
1,2,3,4,7,8-HXCDD	10	ND U	ND U	ND	ND U	ND U	ND U	ND U	ND U	ND U	617
1,2,3,6,7,8-HXCDD	10	ND U J	38.7 J	ND	60.6 J	ND U	ND U	ND U	ND U	ND U	729
1,2,3,7,8,9-HXCDD	10	ND U J	ND U J	ND	27.5 J	ND U	ND U	ND U	ND U	ND U	818
1,2,3,4,6,7,8-HPCDF	10	ND U J	195 J	ND	155 J	33.3 J	ND U J	ND U J	ND U J	21.3	635
1,2,3,4,7,8,9-HPCDF	10	ND U J	ND U J	ND	16.9 J	ND U J	ND U J	ND U J	28.8 J	ND U	655
1,2,3,4,6,7,8-HPCDD	10	104 U J B	1,877 L J E	110 U J B	2,313 L J E	74.4 U J B	ND U	69.2 U J B	69.8 U J B	167 U J B	956
CDF	20	ND U J	65.2 J	ND	591 J	ND U	ND U	ND U J	ND U J	104 J	1,357
CDD	20	896 U J B	21,911 L J E	769 U J B	22,525 L J E	665 U J B	58.0 U J B	738 U J B	238 U J B	1,719 L U J B	4,055 L

0.1 g sample.

Actual amount may be higher because the peak is saturated or the amount exceeds the concentration in the highest calibration standard.

ND = Not detected.

continued

TABLE 2. Continued

Component	Concentration, (ng/kg)									
	V02758 5355J60	V02759 5355J64	V02760 5355J67	V02761 5355J68	V02768 5355J69	V02769 5355J70	V02782 5355J73	V02866 5355J82*	V02867 5355J66*	V02868 5355J72*7
2,3,7,8-TCDF	ND U	108	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J
2,3,7,8-TCDD	ND U	42.6	ND U	ND U J	ND U J	6,810 J	ND U J	ND U J	ND U J	ND U J
1,2,3,7,8-PECDF	ND U J	322 J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U	ND U J
2,3,4,7,8-PECDF	ND U	452 J	ND U J	ND U J	ND U J	ND U	ND U J	ND U J	ND U	ND U J
1,2,3,7,8-PECDD	ND U J	706 J	ND U J	ND U J	ND U J	ND U	ND U J	ND U J	ND U J	ND U J
1,2,3,4,7,8-HXCDF	ND U	2,088 L J E	ND U	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U
1,2,3,6,7,8-HXCDF	ND U J	936 J	ND U	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U
1,2,3,7,8,9-HXCDF	ND U	958 J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U	ND U
2,3,4,6,7,8-HXCDF	ND U	1,151 L J E	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U	ND U
1,2,3,4,7,8-HXCDD	ND U	6,746 L J E	ND U	ND U J	ND U J	ND U	ND U J	ND U J	ND U	ND U
1,2,3,6,7,8-HXCDD	ND U J	14,843 L J E	ND U	ND U J	12.1 J	ND U J	45.6 J	ND U J	5,950 J	1,366
1,2,3,7,8,9-HXCDD	ND U J	4,477 L J E	ND U	ND U J	ND U J	ND U J	ND U J	ND U J	2,260 J	ND U
1,2,3,4,6,7,8-HPCDF	63.0	23,210 L J E	ND U J	ND U J	22.0 J	ND U J	143 J	1,977 U J B	14,589	6,261
1,2,3,4,7,8,9-HPCDF	ND U J	1,648 L J E	ND U J	ND U J	ND U	ND U	ND U J	ND U J	ND U J	ND U
1,2,3,4,6,7,8-HPCDD	871 J	190,118 L J E	64.9 U J B	ND U J	631 J	92.5 U J B	1,034 L J E	14,265 L U J B	138,300 L J E	34,265 L J E
OCDF	328 J	31,666 L J E	ND U J	ND U J	62.1 J	20.0 U J B	401 J	5,067 U J B	39,277 L J E	16,644 J
OCDD	7,771 L J E	1,130,000 L J E	865 U J B	753 U J B	5,970 L J E	987 U J B	6,736 L J E	164,439 L U J B	994,902 J	233,098 L J E

*0.1 g sample.
LActual amount may be higher because the peak is saturated or the amount exceeds the concentration in the highest calibration standard.
ND = Not detected.

continued

TABLE 2. Continued

Component	Concentration, (ng/kg) V02870 5355J63*	V02881 5355J84 *	V02883 5355J75*	V02888 Blank*	V02889 5355J79	V02890 5355J80	V02891 5355J83	V02892 5355J61*	V02893 5355J71*	V02894 5355J72*
2,3,7,8-TCDF	ND U J	ND U	ND U J	ND U	ND U	ND U J	ND U J	ND U J	ND U	ND U
2,3,7,8-TCDD	ND U J	ND U	ND U J	ND U	ND U	ND U J	ND U J	ND U J	ND U	ND U
1,2,3,7,8-PECDF	ND U J	ND U	ND U J	ND U	ND U	ND U J	ND U J	ND U J	ND U	7,183 J
2,3,4,7,8-PECDF	ND U J	ND U	ND U J	ND U	ND U	ND U J	ND U J	ND U J	ND U	15,494 L J E
1,2,3,7,8-PECDD	ND U J	ND U	ND U J	ND U	ND U	ND U J	ND U J	ND U	ND U	3,782 J
1,2,3,4,7,8-HXCDF	ND U J	925	ND U J	ND U	15.1 J	~~ND 49.5~~ J	ND U J	12,883 L J E	3,833	121,249 L J E
1,2,3,6,7,8-HXCDF	ND U J	ND U	ND U J	ND U	ND U	~~49.5~~ U J	ND U J	7,790	1,934	23,332 L J E
1,2,3,7,8,9-HXCDF	ND U J	ND U	ND U J	ND U	ND U J	ND U J	ND U J	ND U	1,608	19,519 L J E
2,3,4,6,7,8-HXCDF	ND U J	757	ND U J	ND U	ND U J	13.9 J	ND U J	2,142	1,260	39,626 L J E
1,2,3,4,7,8-HXCDD	ND U J	ND U	ND U	ND U	ND	ND U J	ND U J	2,615	ND U	6,911
1,2,3,6,7,8-HXCDD	ND U J	6,952	ND U J	ND U	48.2	198 J	24.8 J	13,759 L J E	14,072 L J E	251,087 L J E
1,2,3,7,8,9-HXCDD	3,932 J	1,505	2,553 J	ND U	ND	82.4 J	17.1 J	18,229 L J E	3,273	66,633 L J E
1,2,3,4,6,7,8-HPCDF	16,172 L J E	11,913 L J E	22,123 L J E	~~ND 8107~~ J	173 J	492 J	69.8 J	260,661 L J E	30,547 L J E	924,133 L J E
1,2,3,4,7,8,9-HPCDF	1,836 J	808	2,016	ND U	16.1 J	62.4 J	ND U J	54,117 L J E	4,172 J	155,803 L J E
1,2,3,4,6,7,8-HPCDD	345,146 L J E	107,878 L J E	ND U	4,989 L	963 J	3,500 L J E	471 J	367,223 L J E	336,845 L J E	5,574,000 L J E
OCDF	37,479 L J	9,825	68,670 L J E	~~ND 4673~~ J	225 J	870 J	137 J	194,725 L J E	80,119 L J E	3,847,000 L J E
OCDD	3,749,000 L J	692,196 L J E	939,688 L J E	37,450 L J E	5,618 L J E	20,256 L J E	2,877 L J E	3,100,000 L J E	3,299,000 L J E	9,847,000 L J E

0.1 g sample.
Actual amount may be higher because the peak is saturated or the amount exceeds the concentration in the highest calibration standard.
ND = Not detected.

continued

TABLE 2. Continued

Component	Concentration, (ng/kg)									
	V02901 5355J65*	V02903 5355J81	V02904 5355J81MS	V02906 5355J81MSD	V02907 5355J74	V02913 Blank	V02914 5355J85	V02915 5355J76	V02916 5355J78	V02917 5355J62
2,3,7,8-TCDF	ND U	ND U J	114	103	ND U	ND	ND U J	ND U J	29.9 J	ND U J
2,3,7,8-TCDD	ND U	ND U J	91.3	88.9	ND U J	ND	ND U J	ND U J	ND U J	ND U J
1,2,3,7,8-PECDF	ND U J	33.0 J	529	528	ND U J	ND	ND U J	ND U J	ND U J	181 J
2,3,4,7,8-PECDF	ND U J	64.0 J	535	536	ND U J	ND	ND U J	ND U J	21.8 J	211 J
1,2,3,7,8-PECDD	ND U J	133 J	655	611	ND U J	ND	ND U J	ND U J	22.5 J	ND U J
1,2,3,4,7,8-HXCDF	11,273 L J E	239 J	740	806	ND U	ND	ND U J	ND U J	78.6 J	1,378 L J E
1,2,3,6,7,8-HXCDF	7,637	167 J	708	726	ND U	ND	ND U J	ND U J	39.5 J	433 J
1,2,3,7,8,9-HXCDF	ND U	117 J	521	603	ND U	ND	ND U J	ND U J	ND U J	575 J
2,3,4,6,7,8-HXCDF	4,204	234 J	788	864	ND U	ND	ND U J	ND U J	41.1 J	ND U J
1,2,3,4,7,8-HXCDD	2,276	ND U J	688	729	ND U	ND	ND U J	ND U J	23.6	187 J
1,2,3,6,7,8-HXCDD	66,828 L J E	2,681 L J E	3,169 L	2,899 L	~~27.8~~ U	ND	ND U J	20.0 J	236 J	6,128 L J E
1,2,3,7,8,9-HXCDD	42,696 L J E	930 J	1,992 L	1,544 L	ND U	ND	ND U J	15.2 J	178 J	2,064 L J E
1,2,3,4,6,7,8-HPCDF	1,135,000 L J E	2,741 L J E	3,598 L	3,897 L	382	ND	13.9 J	87.8 J	582 J	15,490 L J E
1,2,3,4,7,8,9-HPCDF	77,364 L J E	192 J	782	730	38.6 J	ND	ND U J	ND U J	ND U J	1,110 L J E
1,2,3,4,6,7,8-HPCDD	4,879,000 L J	27,376 L J E	36,839 L	36,009 L	ND U	36.7	82.6 U J B	700 J	5,912 L J E	95,264 L J E
OCDF	3,514,000 L J E	1,999 J	3,391 L	3,831 L	1,281 J	~~ND~~ 10.8 J	35.9 U J B	297 J	1,348 L J E	33,120 L J E
OCDD	8,956,000 L J E	194,116 L J E	201,208 L	234,728 L	14,681 L J E	377	582 U J B	4,799 L J E	32,128 L J E	699,835 L J E

*0.1 g sample.
Actual amount may be higher because the peak is saturated or the amount exceeds the concentration in the highest calibration standard.
ND = Not detected.

continued

TABLE 2. Continued

Component	Concentration, (ng/kg) V02991 5355J59MSD
2,3,7,8-TCDF	163
2,3,7,8-TCDD	147
1,2,3,7,8-PECDF	741
2,3,4,7,8-PECDF	657
1,2,3,7,8-PECDD	519
1,2,3,4,7,8-HXCDF	722
1,2,3,6,7,8-HXCDF	672
1,2,3,7,8,9-HXCDF	700
2,3,4,6,7,8-HXCDF	688
1,2,3,4,7,8-HXCDD	643
1,2,3,6,7,8-HXCDD	750
.,2,3,7,8,9-HXCDD	767
.,2,3,4,6,7,8-HPCDF	736
.,2,3,4,7,8,9-HPCDF	690
.,2,3,4,6,7,8-HPCDD	1,728
CDF	1,604
CDD	9,968

0.1 g sample.
Actual amount may be higher because the peak is saturated or the amount exceeds the concentration in the highest calibration standard.
D = Not detected.

TABLE 3. RESULTS OF ANALYSES: TOTAL PCDDS AND PCDFS

Component	Concentration, (ng/kg)									
	V02722 5355J53	V02723 5355J54	V02724 5355J57	V02725 5355J58	V02731 5355J52	V02732 5355J51	V02733 5355J55	V02734 5355J56	V02735 5355J59	V02736 5355J59MS
Total TCDF	11.1 J	6.04 J	ND U J	27.7 J	ND U J	ND U J	ND U J	ND U J	ND U J	NA
Total TCDD	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	NA
Total PECDF	66.2 J	57.9 J	ND U J	44.1 J	ND U J	ND U J	ND U J	ND U J	ND U J	NA
Total PECDD	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	NA
Total HXCDF	27.5 J	221 J	23.0 J	292 J	ND U J	ND U J	ND U J	ND U J	17.8 J	NA
Total HXCDD	16.9 J	443 J	ND U J	289 J	ND U J	ND U J	ND U J	ND U J	ND U J	NA
Total HPCDF	62.5 J	568 J	59.6 J	894 J	77.5 J	17.8 J	ND U J	ND U J	103 J	NA
Total HPCDD	232 U J B	11,271 J	177 U J B	4,743 J	227 U J B	11.1 U J B	321 U J B	27.2 U J B	504 U J B	NA
Total OCDF	38.0 J	65.1 J	ND U J	591 J	ND U J	ND U J	ND U J	ND U J	104 J	NA
Total OCDD	895 U J B	21,904 J	769 U J B	22,519 J	665 U J B	58.0 U J B	738 U J B	238 U J B	171 U J B	NA

*0.1 g sample.

[L]Actual amount may be higher because the peak is saturated or the amount exceeds the concentration in the highest calibration standard.

ND - Not detected.

NA - Not reported (matrix spike).

continued

TABLE 3. Continued

Component	Concentration, (ng/kg)									
	V02758 5355J60	V02759 5355J64	V02760 5355J67	V02761 5355J68	V02768 5355J69	V02769 5355J70	V02782 5355J73	V02866 5355J82*	V02867 5355J66*	V02868 5355J72*
Total TCDF	ND U J	229 J	ND U J	ND U J	ND U J	ND U J	2.25 J	ND U J	533 J	217 J
Total TCDD	60.7 J	42.7 J	ND U J	ND U J	ND U J	13,268 J	ND U J	ND U J	ND U J	ND U J
Total PECDF	22.6 J	10,041 J	ND U J	ND U J	ND U J	ND U J	76.9 J	ND U J	4,327 J	2,128 J
Total PECDD	ND U J	1,239 J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J	ND U J
Total HXCDF	82.1 J	53,101 J	ND U J	ND U J	42.8 J	ND U J	309 J	ND U J	28,760 J	10,819 J
Total HXCDD	82.2 J	22,844 J	ND U J	ND U J	45.6 J	6.20 J	85.0 J	319 J	11,238 J	2,882 J
Total HPCDF	324 J	99,518 J	19.2 J	ND U J	102 J	22.5 J	760 J	2,966 U J B	72,482 J	28,491 J
Total HPCDD	1,933 J	345,481 J	ND U J	51.8 U J B	1,797 J	268 U J B	1,845 J	14,508 U J B	221,416 J	54,884 J
Total OCDF	328 J	33,394 J	ND U J	ND U J	61.8 J	20.0 J	401 J	5,070 J	39,265 J	16,639 J
Total OCDD	7,768 J	1,179,587 J	867 U J B	754 U J B	5,947 L J E	987 U J B	6,736 L J E	164,477 L J B	994,661 J	223,057 J

*0.1 g sample.
LActual amount may be higher because the peak is saturated or the amount exceeds the concentration in the highest calibration standard.
ND = Not detected.
NA = Not reported (matrix spike).

continued

TABLE 3. Continued

Component	Concentration, (ng/kg) V02870 5355J603*	V02881 5355J658*	V02883 5355J75*	V02888 Blank	V02889 5355J79	V02890 5355J80	V02891 5355J83	V02892 5355J61*	V02893 5355J71*	V02894 5355J72*
Total TCDF	ND U J	ND U J	ND U J	ND	17.6 J	10.5 J	15.7 J	3,517 J	172 J	3,919 J
Total TCDD	ND U J	ND U J	ND U J	ND	ND U J	ND U J	3.88 J	ND U J	ND U J	116 J
Total PECDF	ND U J	4,502 J	3,691 J	ND	126 J	186 J	85.8 J	13,601 J	10,734 J	263,375 J
Total PECDD	ND U J	ND U J	557 J	ND	ND U J	14.7 J	ND U J	4,633 J	630 J	11,141 J
Total HXCDF	3,932 J	33,001 J	29,613 J	ND	267 J	929 J	128 J	80,038 J	73,329 J	1,667,204 J
Total HXCDD	16,172 J	11,813 J	13,851 J	ND	95.7 J	365 J	62.0 J	86,985 J	28,458 J	622,619 J
Total HPCDF	1,836 U J B	47,649 J	107,310 J	3,357	636 J	786 J	265 J	267,155 J	154,720 J	1,673,191 J
Total HPCDD	345,146 J	193,157 J	229,471 J	10,578	1,659 J	5,902 J	883 J	695,076 J	577,903 J	1,738,913 J
Total OCDF	37,479 J	9,822 J	68,658 J	ND	225 J	866 J	137 J	194,705 J	80,343 J	3,571,385 J
Total OCDD	3,749,000 J	692,074 J	939,550 J	37,446	5,617 J	20,176 J	2,873 J	3,099,483 J	3,308,634 J	1,680,770 J

*0.1 g sample.
UActual amount may be higher because the peak is saturated or the amount exceeds the concentration in the highest calibration standard.
ND = Not detected.
NA = Not reported (matrix spike).

continued

TABLE 3. Continued

Component	Concentration, (ng/kg)									
	V02901 5355J65*	V02903 5355J81	V02904 5355J81MS	V02906 5355J81MSD	V02907 5355J74	V02913 Blank	V02914 5355J85	V02915 5355J76*	V02916 5355J78	V02917 5355J62
Total TCDF	1,540 J	253 J	NA	NA	ND UJ	ND	44.0 J	ND UJ	327 J	306 J
Total TCDD	2,190	29.2	NA	NA	ND UJ	ND	ND UJ	ND UJ	34.8	144
Total PECDF	52,798	2,337	NA	NA	217 J	ND	38.4 J	29.6 J	1,747	6,558
Total PECDD	24,710	378	NA	NA	ND UJ	ND	ND UJ	ND UJ	82.7	220
Total HXCDF	467,960	9,050	NA	NA	23.2 J	ND	21.4 J	149 J	1,502	30,484
Total HXCDD	459,929	3,621	NA	NA	21.8 J	ND	ND UJ	63.1 J	950	6,857
Total HPCDF	2,825,172	11,623	NA	NA	1,668 J	ND	49.5 J	452 UJB	2,633	67,596
Total HPCDD	10,914,000	49,149	NA	NA	3,428 J	102	158 UJB	1,570 UJB	10,771	159,623
Total OCDF	3,513,439	1,998	NA	NA	1,280 J	ND	355 J	296 J	1,347	33,164
Total OCDD	8,954,730	194,074	NA	NA	14,671 J	377	575 UJB	4,795 UJB	32,092	700,786

*0.1 g sample.

[L]Actual amount may be higher because the peak is saturated or the amount exceeds the concentration in the highest calibration standard.

ND = Not detected.

NA = Not reported (matrix spike).

TABLE 3. Continued

Component	Concentration, (ng/kg) VOXXXX 5355J59MSD
Total TCDF	NA
Total TCDD	NA
Total PECDF	NA
Total PECDD	NA
Total HXCDF	NA
Total HXCDD	NA
Total HPCDF	NA
Total HPCDD	NA
Total OCDF	NA
Total OCDD	NA

*0.1 g sample.
[L]Actual amount may be higher because the peak is saturated or the amount exceeds the concentration in the highest calibration standard.
ND = Not detected.
NA = Not reported (matrix spike).

ROY F. WESTON, INC.
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PHONE: (206) 286-6000

MEMORANDUM

DATE: 12 November 1990

TO: Lee Marshal, RPM, USEPA, Region X

FROM: Roger McGinnis, Chief Environmental Chemist, WESTON, Seattle

SUBJECT: QA of Case 5355J (Dioxins/Furans)
SDG No. 5355J-099
American Crossarm and Conduit

DOC. CONTROL NO.: 4000-01-24-AABW

WORK ORDER NO.: 4000-01-24-0004

CC: Laura Castrilli, RSCC, USEPA, Region X
Gerald Muth, DPO, USEPA, Region X (memo only)
Tom Bennett, DPO, USEPA, Region IV (memo only)
Robert Melton, QA Management Branch, USEPA, Region X
Steve Fuller, Project Manager, WESTON, Seattle (memo only)
Craig Mitchell, Data Base Manager, WESTON, Seattle

The quality assurance review of six samples, Case 5355J, collected from American Crossarm and Conduit has been completed. The six soil samples were analyzed at low level for polychlorinated dibenzodioxins and furans (PCDD/PCDF) by Twin City Testing of St. Paul, Minnesota, using EPA Method 8290. The samples were numbered:

5355J-099	5355J-100	5355J-101
5355J-102	5355J-103	5355J-104

Data Qualifications

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in USEPA Method 8290 (May 1987) and described in the Special Analytical Services Request "ESAT-10-557."

1. Timeliness

   No holding time criteria have been established though EPA Region X has approved holding times of six months for archived soil samples. Samples were held at 4°C for up to 70 days. Samples were extracted within 10 days after laboratory receipt and analyzed within 14 days after extraction.

2. Mass Resolution (10,000) Check - Acceptable

3. Column Performance Check

All column performance check analyses met criteria.

a. Peak Resolution - Acceptable

Standards met peak valley criteria of less than 25 percent between $^{13}C_{12}$ - 1,2,3,4-TCDD and $^{13}C_{12}$ - 2,3,7,8-TCDD at m/z 334.

b. Retention Time Windows - Acceptable

c. Instrument Mass Lock - Acceptable

Perfluorokerosene mass lock was stable.

4. Initial Calibration

a. Internal Standard Retention Time - Acceptable

b. Peak Retention Time Ratios - Acceptable

c. Internal Standard Recovery - Acceptable

Internal standard recoveries met EPA SAS QC limits of 60 to 140 percent.

d. Isotopic Peak Area Ratios

Relative ion abundance ratios met method criteria for all compounds.

e. Peak Coincidence - Acceptable

Peaks for M/M^{+2} or M^{+2}/M^{+4} maximized within two scans of one another.

f. Linearity - Acceptable

Relative response factors (RRF) met relative standard deviation (RSD) criteria of 35 percent.

5. Continuing Calibrations

a. Internal Standard Retention Time - Acceptable

All internal standard retention times were within 0.25 minutes of those established in the initial calibration.

b. Peak Retention Time Ratios - Acceptable

c. Internal Standard Calculated Recovery

Calibration standard recoveries calculated using internal standards met 60 to 140 percent recovery limits requested in the EPA SAS request.

d. Internal Standard Calculated RRF Percent Difference

Calibration standard RRF percent differences calculated using internal standards met EPA organics analysis limits of 25 percent for all samples.

e. Isotopic Peak Area Ratios

Relative ion abundance ratios met method criteria for all compounds.

f. Peak Relative Retention Time Ratios - Acceptable

g. Peak Coincidence - Acceptable

Peaks for M/M^{+2} or M^{+2}/M^{+4} maximized within two scans of one another for all compounds.

6. Instrument Detection Limits - Acceptable

Instrument detection limits were not provided by the laboratory. However, all analyses met contract required quantitation limits (CRQL). Detection limits for specific homologues were elevated in samples due to the presence of chlorinated biphenylene ether interferences.

7. Laboratory Method Blanks - Acceptable

Laboratory method blank frequency criteria were met.

The following compounds were detected in laboratory method blanks at concentrations significantly below requested quantitation limits.

Blank Run	Compound	Concentration (ng/kg)	CRQL (ng/kg)
	OCDD	13	200

Reported levels of the above compounds were flagged "UJ" (undetected, adjusted quantitation limit) in samples if concentrations were less than five times concentrations present in the blank.

Percent recovery for the $^{13}C_{12}$-OCDD internal standard was 47 percent, below QC limits of 60 - 140 percent.

8. Matrix Spike

The laboratory did not specify which sample underwent matrix spike analysis (or if a blank spike was performed instead). All matrix spike (MS) percent recoveries met QC guidelines of 70 - 130 percent. No duplicate spike analysis was performed, therefore precision could not be evaluated.

9. Field Duplicate Analysis

No field duplicates were submitted with this sample delivery group.

10. Performance Evaluation Sample Results

No performance evaluation sample was submitted with this sample delivery group.

11. Sample Analysis and Peak Identification Criteria

a. Internal Standard Retention Time

Retention time differences for internal standards were within QC guidelines of less than 0.25 minutes for all samples.

b. Standard Peak Relative Retention Time Ratios

Standard peak retention time ratios met QC guidelines for all samples.

c. Compound Retention Time

All compounds reported by the laboratory were within retention time windows established by calibrations.

d. Internal Standard Recovery

All compounds reported by the laboratory met recovery criteria except the following:

Sample No.	Internal Standard	Percent Recovery	QC Limits
5355J-101	$^{13}C_{12}$-2,3,4,7,8-PeCDF	160	60 - 140
5355J-102	$^{13}C_{12}$-2,3,4,7,8-PeCDF	153	
5355J-104	$^{13}C_{12}$-OCDD	157	

Positive results for compounds associated with internal standards and samples listed above have been flagged "J" (estimated.

e. Isotopic Peak Area Ratios

Relative ion abundance ratios met method criteria for all internal standards and compounds reported as present by the laboratory.

f) Peak Coincidence - Acceptable

Peaks for M/M^{+2} or M^{+2}/M^{+4} maximized within two seconds of one another fore a compounds reported by the laboratory.

11. Sample Analysis

Several samples contained high concentrations of chlorinated dioxins and furans as well as petroleum hydrocarbons resulting in both column overloading and detector saturation. In addition, all samples contained chlorinated biphenylene ethers interferences resulting in elevated detection limits.

The laboratory did not provide raw instrumental peak area data, only handwritten peak area summary sheets.

12. Laboratory Contact

No laboratory contact was required.

Data Assessment

The usefulness of the data is based on the criteria outlined in USEPA Method 8290 (May 1987) and described in the Special Analytical Services Request "ESAT-10-557."

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers which modify the usefulness of the individual values.

Additional data packages associated with this project are expected from CLP or EPA laboratories.

Data Qualifiers

U - The material was analyzed for, but was not detected. The associated numerical value is an estimated sample quantitation limit.

J - The associated numerical value is an estimated quantity because quality control criteria were not met or concentrations reported were less than the CRDL.

R - Quality Control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

Q - No analytical result.

N - Presumptive evidence of presence of material (tentative identification).

B - The compound was found in the laboratory blank as well as the sample.

E - Reported concentration exceeded the calibration range.

0124AABW

****
TWIN CITY TESTING CORPORATION
* PCDF/PCDD ANALYSIS RESULTS *
****
Client....EPA

Sample ID (Client's#)....5355J-099
Sample ID (TCT#).....207217
Analysis Date.....8/13/90
Filename.....V00813H
Analyst.....BB
Sample Amount.....0.0010 kg
ICAL Date.....6-15-90
CCAL Filename.....V00813C

NATIVE ISOMERS	CONC. ng/kg	DL ng/kg
2378-TCDF	9.9	-----
TOTAL TCDF	38.0	-----
2378-TCDD	nd	6.2
TOTAL TCDD	3.5	-----
12378-PeCDF	23.0	-----
23478-PeCDF	16.0	-----
TOTAL PeCDF	330.0	-----
12378-PeCDD	14.0	-----
TOTAL PeCDD	34.0	-----
123478-HxCDF	110.0	-----
123678-HxCDF	nd	99.0
123789-HxCDF	21.0	-----
234678-HxCDF	nd	3.8
TOTAL HxCDF	2100.0	-----
123478-HxCDD	46.0	-----
123678-HxCDD	230.0	-----
123789-HxCDD	100.0	-----
TOTAL HxCDD	900.0	-----
1234678-HpCDF	710.0	-----
1234789-HpCDF	62.0	-----
TOTAL HpCDF	770.0	-----
1234678-HpCDD	5700.0	-----
TOTAL HpCDD	9900.0	-----
OCDF	2400.0	-----
OCDD	44000.0	-----

INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF-C13....	2.00	90
2378-TCDD-C13....	2.00	100
12378-PeCDF-C13..	2.00	94
23478-PeCDF-C13..	2.00	121
12378-PeCDD-C13..	2.00	97
123478-HxCDF-C13.	2.00	77
123678-HxCDF-C13.	2.00	61
123789-HxCDF-C13.	2.00	89
234678-HxCDF-C13.	2.00	72
123478-HxCDD-C13.	2.00	93
123678-HxCDD-C13.	2.00	64
1234678-HpCDF-C13	2.00	73
1234789-HpCDF-C13	2.00	66
1234678-HpCDD-C13	2.00	66
OCDD-C13.....	4.00	60
1234-TCDD-C13....	2.00	na
123789-HxCDD-C13.	2.00	na
2378-TCDD-C137...	0.80	101

Total 2378-TCDD Equivalence = 36 ng/kg
(Using EPA 8290 Factors)

CONC= Concentrations, calculated as described in EPA method 8290.

DL= Detection limits, calculated as described in EPA method 8290.

na= not applicable

nd= not detected

TCT Invoice Number....4410 90-6539

****
TWIN CITY TESTING CORPORATION
* PCDF/PCDD ANALYSIS RESULTS *
****
Client....EPA

Sample ID (Client's#).....5355J-100
Sample ID (TCT#).....207219
Analysis Date.....8/13/90
Filename.....V00813L
Analyst.....BB
Sample Amount.....0.0011 kg
ICAL Date.....6-15-90
CCAL Filename.....V00813C

NATIVE ISOMERS	CONC. ng/kg	DL ng/kg	INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF	78	-----	2378-TCDF-C13....	2.00	97
TOTAL TCDF	260	-----	2378-TCDD-C13....	2.00	105
			12378-PeCDF-C13..	2.00	96
2378-TCDD	nd	21	23478-PeCDF-C13..	2.00	130
TOTAL TCDD	nd	-----	12378-PeCDD-C13..	2.00	103
			123478-HxCDF-C13.	2.00	70
12378-PeCDF	260	-----	123678-HxCDF-C13.	2.00	58
23478-PeCDF	200	-----	123789-HxCDF-C13.	2.00	86
TOTAL PeCDF	3800	-----	234678-HxCDF-C13.	2.00	65
			123478-HxCDD-C13.	2.00	93
12378-PeCDD	130	-----	123678-HxCDD-C13.	2.00	60
TOTAL PeCDD	160	-----	1234678-HpCDF-C13	2.00	73
			1234789-HpCDF-C13	2.00	61
123478-HxCDF	2100	-----	1234678-HpCDD-C13	2.00	66
123678-HxCDF	660	-----	OCDD-C13.....	4.00	61
123789-HxCDF	410	-----			
234678-HxCDF	52	-----	1234-TCDD-C13....	2.00	na
TOTAL HxCDF	38000	-----	123789-HxCDD-C13.	2.00	na
123478-HxCDD	700	-----	2378-TCDD-C137...	0.80	100
123678-HxCDD	7800	-----			
123789-HxCDD	1000	-----			
TOTAL HxCDD	18000	-----			
1234678-HpCDF	10000	-----			
1234789-HpCDF	1100	-----			
TOTAL HpCDF	55000	-----			
1234678-HpCDD	130000	-----			
TOTAL HpCDD	210000	-----			
OCDF	40000	-----	Total 2378-TCDD Equivalence =	684 ng/kg	
OCDD	860000	-----	(Using EPA 8290 Factors)		

CONC= Concentrations, calculated as described in EPA method 8290.

DL= Detection limits, calculated as described in EPA method 8290.

na= not applicable

nd= not detected

TCT Invoice Number....4410 90-6539

****
TWIN CITY TESTING CORPORATION
* PCDF/PCDD ANALYSIS RESULTS *
****
Client....EPA

Sample ID (Client's#)....5355J-101
Sample ID (TCT#).....207220
Analysis Date.....8/13/90
Filename.....V00813M
Analyst.....BB
Sample Amount.....0.0012 kg
ICAL Date.....6-15-90
CCAL Filename.....V00813C

NATIVE ISOMERS	CONC. ng/kg	DL ng/kg	INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF	530	-----	2378-TCDF-C13....	2.00	97
TOTAL TCDF	14000	-----	2378-TCDD-C13....	2.00	107
			12378-PeCDF-C13..	2.00	116
2378-TCDD	300	-----	23478-PeCDF-C13..	2.00	160
TOTAL TCDD	1600	-----	12378-PeCDD-C13..	2.00	125
			123478-HxCDF-C13.	2.00	108
12378-PeCDF	1200	-----	123678-HxCDF-C13.	2.00	78
23478-PeCDF	1000 J	-----	123789-HxCDF-C13.	2.00	109
TOTAL PeCDF	49000	-----	234678-HxCDF-C13.	2.00	78
			123478-HxCDD-C13.	2.00	94
12378-PeCDD	7100	-----	123678-HxCDD-C13.	2.00	99
TOTAL PeCDD	20000	-----	1234678-HpCDF-C13	2.00	99
			1234789-HpCDF-C13	2.00	70
123478-HxCDF	7600	-----	1234678-HpCDD-C13	2.00	91
123678-HxCDF	9900	-----	OCDD-C13.....	4.00	95
123789-HxCDF	4200	-----			
234678-HxCDF	200	-----	1234-TCDD-C13....	2.00	na
TOTAL HxCDF	200000	-----	123789-HxCDD-C13.	2.00	na
123478-HxCDD	11000	-----	2378-TCDD-C137...	0.80	117
123678-HxCDD	39000	-----			
123789-HxCDD	24000	-----			
TOTAL HxCDD	190000	-----			
1234678-HpCDF	86000	-----			
1234789-HpCDF	6800	-----			
TOTAL HpCDF	93000	-----			
1234678-HpCDD	710000	-----			
TOTAL HpCDD	1200000	-----			
OCDF	170000	-----			
OCDD	>2300000*JE	-----			

Total 2378-TCDD Equivalence = 8314 ng/kg (Using EPA 8290 Factors)

* Saturated signal
CONC= Concentrations, calculated as described in EPA method 8290.

DL= Detection limits, calculated as described in EPA method 8290.

na= not applicable

nd= not detected

TCT Invoice Number....4410 90-6539

****
TWIN CITY TESTING CORPORATION
* PCDF/PCDD ANALYSIS RESULTS *
****
Client....EPA

Sample ID (Client's#)....5355J-102
Sample ID (TCT#).....207221
Analysis Date.....8/13/90
Filename.....V00813N
Analyst.....BB
Sample Amount.....0.0012 kg
ICAL Date.....6-15-90
CCAL Filename.....V00813C

NATIVE ISOMERS	CONC. ng/kg	DL ng/kg	INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF	520	-----	2378-TCDF-C13....	2.00	98
TOTAL TCDF	13000	-----	2378-TCDD-C13....	2.00	109
			12378-PeCDF-C13..	2.00	112
2378-TCDD	270	-----	23478-PeCDF-C13..	2.00	153
TOTAL TCDD	1400	-----	12378-PeCDD-C13..	2.00	113
			123478-HxCDF-C13.	2.00	96
12378-PeCDF	1200	-----	123678-HxCDF-C13.	2.00	74
23478-PeCDF	1000 J	-----	123789-HxCDF-C13.	2.00	113
TOTAL PeCDF	52000	-----	234678-HxCDF-C13.	2.00	88
			123478-HxCDD-C13.	2.00	109
12378-PeCDD	7900	-----	123678-HxCDD-C13.	2.00	81
TOTAL PeCDD	21000	-----	1234678-HpCDF-C13	2.00	94
			1234789-HpCDF-C13	2.00	72
123478-HxCDF	6300	-----	1234678-HpCDD-C13	2.00	101
123678-HxCDF	10000	-----	OCDD-C13.....	4.00	103
123789-HxCDF	4200	-----			
234678-HxCDF	83	-----	1234-TCDD-C13....	2.00	na
TOTAL HxCDF	200000	-----	123789-HxCDD-C13.	2.00	na
123478-HxCDD	14000	-----	2378-TCDD-C137...	0.80	108
123678-HxCDD	47000	-----			
123789-HxCDD	33000	-----			
TOTAL HxCDD	220000	-----			
1234678-HpCDF	89000	-----			
1234789-HpCDF	7000	-----			
TOTAL HpCDF	96000	-----			
1234678-HpCDD	650000	-----			
TOTAL HpCDD	1100000	-----			
OCDF	160000	-----			
OCDD	>2300000*JE	-----			

Total 2378-TCDD Equivalence = 9418 ng/kg (Using EPA 8290 Factors)

* = Saturated signal
CONC= Concentrations, calculated as described in EPA method 8290.

DL= Detection limits, calculated as described in EPA method 8290.

na= not applicable

nd= not detected

TCT Invoice Number....4410 90-6539

****
TWIN CITY TESTING CORPORATION
* PCDF/PCDD ANALYSIS RESULTS *
****
Client....EPA

Sample ID (Client's#)....5355J-103
Sample ID (TCT#).....207222
Analysis Date.....8/14/90
Filename.....V00814O
Analyst.....BB
Sample Amount.....0.0011 kg
ICAL Date.....6-15-90
CCAL Filename.....V00814B
Method Blank Filename....V00814D

NATIVE ISOMERS	CONC. ng/kg	DL ng/kg	INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF	260	-----	2378-TCDF-C13....	2.00	100
TOTAL TCDF	5200	-----	2378-TCDD-C13....	2.00	97
			12378-PeCDF-C13..	2.00	100
2378-TCDD	180	-----	23478-PeCDF-C13..	2.00	136
TOTAL TCDD	2100	-----	12378-PeCDD-C13..	2.00	100
			123478-HxCDF-C13.	2.00	91
12378-PeCDF	300	-----	123678-HxCDF-C13.	2.00	64
23478-PeCDF	270	-----	123789-HxCDF-C13.	2.00	100
TOTAL PeCDF	13000	-----	234678-HxCDF-C13.	2.00	75
			123478-HxCDD-C13.	2.00	73
12378-PeCDD	1700	-----	123678-HxCDD-C13.	2.00	89
TOTAL PeCDD	7100	-----	1234678-HpCDF-C13	2.00	84
			1234789-HpCDF-C13	2.00	67
123478-HxCDF	2700	-----	1234678-HpCDD-C13	2.00	81
123678-HxCDF	1700	-----	OCDD-C13.....	4.00	67
123789-HxCDF	910	-----			
234678-HxCDF	600	-----	1234-TCDD-C13....	2.00	na
TOTAL HxCDF	55000	-----	123789-HxCDD-C13.	2.00	na
123478-HxCDD	2700	-----	2378-TCDD-C137...	0.80	103
123678-HxCDD	9600	-----			
123789-HxCDD	6000	-----			
TOTAL HxCDD	57000	-----			
1234678-HpCDF	22000	-----			
1234789-HpCDF	1400	-----			
TOTAL HpCDF	75000	-----			
1234678-HpCDD	200000	-----			
TOTAL HpCDD	350000	-----			
OCDF	64000	-----	Total 2378-TCDD Equivalence =	2214	ng/kg
OCDD	1300000	-----	(Using EPA 8290 Factors)		

CONC= Concentrations, calculated as described in EPA method 8290.

DL= Detection limits, calculated as described in EPA method 8290.

na= not applicable

nd= not detected

TCT Invoice Number....4410 90-6539

****
TWIN CITY TESTING CORPORATION
* PCDF/PCDD ANALYSIS RESULTS *
****
Client....EPA

Sample ID (Client's#)....5355J-104
Sample ID (TCT#).....207224
Analysis Date.....8/14/90
Filename.....V00814P
Analyst.....BB
Sample Amount.....0.0010 kg
ICAL Date.....6-15-90
CCAL Filename.....V00814B

NATIVE ISOMERS	CONC. ng/kg	DL ng/kg
2378-TCDF	3300	-----
TOTAL TCDF	12000	-----
2378-TCDD	240	-----
TOTAL TCDD	660	-----
12378-PeCDF	6600	-----
23478-PeCDF	4600	-----
TOTAL PeCDF	110000	-----
12378-PeCDD	8800	-----
TOTAL PeCDD	18000	-----
123478-HxCDF	nd	35000
123678-HxCDF	12000	-----
123789-HxCDF	6700	-----
234678-HxCDF	1500	-----
TOTAL HxCDF	670000	-----
123478-HxCDD	22000	-----
123678-HxCDD	130000	-----
123789-HxCDD	45000	-----
TOTAL HxCDD	440000	-----
1234678-HpCDF	280000	-----
1234789-HpCDF	30000	-----
TOTAL HpCDF	1500000	-----
1234678-HpCDD	>2200000*JE	-----
TOTAL HpCDD	>3600000*JE	-----
OCDF	670000	-----
OCDD	>2500000*JE	-----

INTERNAL STANDARDS	ng's ADDED	PERCENT RECOVERY
2378-TCDF-C13....	2.00	112
2378-TCDD-C13....	2.00	117
12378-PeCDF-C13..	2.00	102
23478-PeCDF-C13..	2.00	139
12378-PeCDD-C13..	2.00	106
123478-HxCDF-C13.	2.00	93
123678-HxCDF-C13.	2.00	73
123789-HxCDF-C13.	2.00	102
234678-HxCDF-C13.	2.00	81
123478-HxCDD-C13.	2.00	98
123678-HxCDD-C13.	2.00	86
1234678-HpCDF-C13	2.00	88
1234789-HpCDF-C13	2.00	71
1234678-HpCDD-C13	2.00	100
OCDD-C13.....	4.00	157
1234-TCDD-C13....	2.00	na
123789-HxCDD-C13.	2.00	na
2378-TCDD-C137...	0.80	131

Total 2378-TCDD Equivalence = 17038 ng/kg
(Using EPA 8290 Factors)

* = Saturated signal
CONC= Concentrations, calculated as described in EPA method 8290.

DL= Detection limits, calculated as described in EPA method 8290.

na= not applicable

nd= not detected

TCT Invoice Number....4410 90-6539

Inter-Office Memorandum

TO: Steve Fuller - Site Manager
Keith Pine - RI Manager

cc: Robert Schoenfelder/ WESTON H&S

FROM: Roger McGinnis - RSO DATE: October 1, 1990

PROJECT: American Crossarm & Conduit W.O. NO.: 4000-01-23-0011

SUBJECT: Site Access/Health and Safety Plan Modifications

ACTION: Chlorinated dioxins and furans, pentachlorophenol, and polycyclic aromatic hydrocarbons have been detected across the entire site at concentrations which may present a health hazard for individuals on the property. Based on analytical results site access restrictions and modifications to the WESTON health and safety plan are required.

I am currently preparing an amendment to the HASP; this memo contains highlights of the amendments.

As WESTON regional safety officer, I recommend that site access should be immediately restricted to personnel directly involved with the remedial investigation covered under WESTON's Health and Safety Plan. This action is to prevent exposure to unprotected individuals both from direct contact and incidental ingestion or inhalation of contaminated soil.

In addition a number of actions are necessary to ensure WESTON employees and subcontractors are not exposed while working on site. OSHA and WISHA regulations indicate personnel may be safeguarded (in order of preference) by the use of engineering controls, administrative controls and personnel protective equipment. The changes which will be required to protect workers will necessitate an increase both in time required to perform work and additional costs for protective and monitoring equipment. In addition, a full-time, on-site health and safety coordinator will be required during any Level C work.

The following engineering controls will need to be instituted prior to future site work:

- Controls to prevent dust generation and/or tracking of soil into the field office or off the site should be instituted for (1) the main driveway (area south of trailer and by decontamination area), (2) all unpaved

Potential control options include soil stabilization or wetting in non-traffic areas and paving or plastic sheeting/gravel for traffic areas. Additional options may also be available.

- MiniRam real-time, particulate air monitoring will be necessary to measure ambient dust concentrations to obtain estimates of airborne contaminant concentrations. Results will be used to institute additional engineering controls and make decisions regarding upgrading the level of personnel protection.

The following administrative controls will be required for all site activities:

- Site access should immediately be restricted to personnel directly involved with the remedial investigation covered under WESTON's Health and Safety Plan. This action is to prevent exposure to unprotected individuals both from direct contact and incidental ingestion or inhalation of contaminated soil.

- No materials should be brought on site or removed without WESTON or EPA approval. This action is to prevent movement or possible removal of contaminated materials.

- There will be no eating or tobacco use on site. This action is to prevent accidental ingestion of soil or dust.

- All sample containers and field equipment and instrumentation will be thoroughly decontaminated prior to bringing them into the office trailer to prevent accidental contamination.

- All personnel and equipment will be required to undergo a more rigorous decontamination procedure prior to entering the field trailer or leaving the site. This decon will include requirements for a hot, soapy water wash for personnel.

Personnel protective equipment modifications will include the following:

- All personnel will be required to wear disposable booties, coveralls, and gloves during field activities on site.

- Upgrading personnel protection level will be required for all intrusive or dust/particulate generating activities (i.e., grading, borehole drilling, etc.) to prevent inhalation or ingestion of contaminated material if engineering controls cannot be demonstrated to adequately protect personnel.